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Navy Cmdr. Walt DeGrange is part of a team of Naval Postgraduate School researchers that is rethinking the way naval vessels refuel and take on supplies. He and his team have developed an innovative program known as the Replenishment at Sea Planner (RASP) which aims to save the Navy millions of dollars in fuel costs.

Faculty at the Naval Postgraduate School (NPS) have developed a shipping resupply program that aims to save the Navy millions of dollars in fuel costs.

Navy Cmdr. Walt DeGrange of Knoxville, Tenn., is part of a team of researchers that are rethinking the way naval vessels refuel and take on supplies. He and his team have developed an innovative program known as the Replenishment at Sea Planner (RASP).

“The idea is to plan optimal shipping routes that allow vessels to replenish at sea,” said DeGrange. “The U.S. Navy has the greatest naval capability in the history of the world because we can stay at sea indefinitely … There are very few foreign navies that have this capability, it’s one of the things that makes our Navy so unique.”

NPS research associate, Anton Rowe of Honolulu, Hi., wrote the detailed code that makes RASP work.

“Everyone has seen video of the Air Force refueling in midair, this is the Navy’s equivalent of aerial refueling operations,” said Rowe.

Traditionally, navies have had to pull into ports to take on fuel and supplies. The U.S. Navy is different in that it forward deploys supply ships globally, and is able to conduct replenishment operations while fleets are underway. This ability increases the speed with which naval units can deploy and saves millions of dollars annually.

“The Replenishment at Sea Planner (RASP) creates a schedule that minimizes the distance that supply ships have to travel, and identifies routes that allow vessels to travel at speeds optimal to fuel conservation,” said Rowe.

“The 5th Fleet out of Bahrain is currently using RASP,” added DeGrange. “In the past, planners had to sit down with a pencil and paper to plan out resupply routes and schedules – it was a very time consuming process. Utilizing RASP, planners can accomplish with a few keystrokes what took planners many hours to do by hand.”

Planning supply routes by hand is not only time consuming, it is also prone to human error. If a planner makes a mistake, supply ships have to sail faster to catch customer ships. Increased speeds force vessels to burn more diesel, increasing fuel costs exponentially.

RASP was designed at NPS utilizing software familiar to most planners, Microsoft Excel.

“People think of Excel as being a place to make tables and input figures, but Excel is really just an excellent place to store information, and it is available on computers across the fleet … the program also has a validate button that allows you to validate your information and make adjustments as needed,” said Rowe.

Information that previously took days to analyze by hand is input to the Excel-based program.

“The input is all of the customer ship schedules, supplies and ports,” said DeGrange. “You run the model and the output is a schedule that gives you the optimal routes. The RASP program can evaluate hundreds of thousands of possible routes and give the best option in a matter of minutes.

“You can also do ‘what if’ schedules that take in factors like schedule changes or port unavailability and solve for these factors,” added DeGrange.

RASP is based on an earlier program known as the Navy Combat Logistics Force (CLF) planner. The CLF planner answered the question of how many and what type of supply ships to build in the future.

“RASP does at the micro level what CLF accomplished at the macro level,” said DeGrange.

The CLF planner helps logisticians to deal with large numbers of ships each day around the globe, whereas RASP looks at the availability of a single ship in a region to replenish multiple ships over a four-hour window.

“I think RASP answers the questions, “Can I do more with less?” and, “Can I change the business rules?” said DeGrange.

The 5th Fleet in Bahrain launched RASP just last week, Feb. 5. While it will be several months before final cost savings will be fully determined, DeGrange and his team are hopeful they will be in the millions of dollars.

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Navy Lt. Cmdr. Alonza Ross keeps a close eye on the heavy seas during an underway replenishment with the Military Sealift Command fleet replenishment oiler USNS PATUXENT (T-AO 201) aboard the aircraft carrier USS Dwight D. Eisenhower (CVN 69). Faculty at the Naval Postgraduate School (NPS) have developed a shipping resupply program that aims to improve operation like these, saving the Navy millions of dollars in fuel costs.